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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/390,389	09/03/1999	HUI-LING LOU	13-13	6784

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JOSEPH B. RYAN
RYAN, MASON & LEWIS, LLP
90 FOREST AVENUE
LOCUST VALLEY, NY 11560

EXAMINER

BURD, KEVIN MICHAEL

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 12/08/2003

16

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/390,389

Applicant(s)

LOU ET AL.

Examiner

Kevin M Burd

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,8-16,18-22 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5,10-16,21-22,24 is/are allowed.
- 6) ☒ Claim(s) 8,9,19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action, in response to the remarks filed 9/8/2003, is a final office action.

Response to Amendment

2. Applicant's arguments filed 9/8/2003 have been fully considered but they are not persuasive. As stated in the previous office action, the combination discloses means for receiving as inputs real and imaginary parts of an element of the channel estimate, and generating as outputs real and imaginary parts of a product of the element of the channel estimate and a corresponding element of the given symbol, without requiring a multiplication operation as shown in the previous office action and restated below. These components described make up the "selector".

In response to applicant's argument that the Jones and Katz references are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Jones is in the communication system art and Katz is in the digital logic design art and deals with logic design for arithmetic circuitry such as adders. This digital arithmetic circuitry is commonly found in communication systems.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the teachings of Katz into the apparatus and method of Jones. The logic and adders will eliminate computational complexity of the multipliers of Jones and simpler components can be used in their stead.

For these reasons and the reasons stated in the previous office action, the rejections are maintained and stated below. However, the rejections of claims 8, 9, 19 and 20 have been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5, 10-16, 21, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al (US 6,233,271) in view of Contemporary Logic design, Randy H Katz, 1994, pages 266-269.

Regarding claims 1, 2, 11-13, 22 and 24, Jones discloses an apparatus and method of process information in a receiver. Jones receives a signal that is mapped to a point in a constellation (column 9, lines 34-37). This signal is processed when received. It is inherent that for any first constellation, there exists a constellation that is a rotated version of that first constellation. Therefore the first constellation will always correspond to a rotated version of a second constellation. Jones further discloses calculating a channel estimation value and outputting the selected value to decoding elements (figure 16 and column 12, lines 30-48). The received signal and channel estimation are input to a decoder to recover the original symbol that was transmitted from the transmitter (abstract). The received signal contains both in-phase and quadrature components (abstract).

Jones does not disclose outputting the recovered symbol without requiring a multiplication operation. Katz discloses, in pages 266-269, any multiplication operation can be computed using only logical gates and adders instead of multipliers. This is shown on page 267 and in figure 5.28. It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the teachings of Katz into the apparatus and method of Jones. The logic and adders will eliminate computational complexity of the multipliers of Jones and simpler components can be used in their stead.

Regarding claims 3 and 14, it is inherent that for any first constellation, there exists a constellation that is a 45 degree rotated version of that first constellation. Therefore the first constellation will always correspond to a rotated version of a second constellation.

Regarding claims 4 and 15, Jones discloses utilizing a PSK constellation (abstract).

Regarding claims 5 and 16, Jones discloses utilizing the maximum likelihood-decoding algorithm of a Viterbi decoder (abstract).

Regarding claims 10 and 21, Katz discloses how the input signal is processed before being input to the decoder of Jones.

Allowable Subject Matter

4. Claims 8, 9, 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any response to this final action should be mailed to:

Box AF

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications; please mark "EXPEDITED PROCEDURE" or for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Burd, whose telephone number is (703) 308-7034. The Examiner can normally be reached on Monday-Thursday from 9:00 AM - 6:00 PM.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.

Kevin M. Burd

Kevin M. Burd
PATENT EXAMINER
12/3/03

TEMESGHEN GHEBREYESAE
PRIMARY EXAMINER